

A SEASONAL CHANGE OF THE AGE COMPOSITION IN A POPULATION OF THE PSEUDOSCORPION, *NEOBISIUM (PAROBISIUM) PYGMAEUM* (ELLINGSEN), IN A TEMPERATE DECIDUOUS FOREST

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Synopsis

KOBARI, Hiroshi (Yuki Dai-ichi Senior High School, 1076 Yuki, Ibaraki Pref. 307, Japan): A seasonal change of the age composition in a population of the pseudoscorpion, *Neobisium (Parobisium) pygmaeum* (ELLINGSEN), in a temperate deciduous forest. *Acta arachnol.*, 31: 65-71 (1983).

The age composition in a population of the pseudoscorpion, *Neobisium (Parobisium) pygmaeum* (ELLINGSEN), was studied every month. A total of 273 individuals including 66 protonymphs, 65 deutonymphs and 142 tritonymphs were collected from the study site in Shimozuma, Ibaraki Pref. in central Japan, during the study period from May 15, 1978 to June 28, 1979. A seasonal change was presumed in the number of nymphs in each stage. Some remarks on the life cycle of this species in the present population were also made.

Introduction

Studies on the population structure and the life history of pseudoscorpions have been carried out by some authors. GABBUTT and VACHON (1963, 1965, 1967, 1968) investigated several English pseudoscorpions, and NELSON (1973) studied *Microbisium confusum* HOFF in North America. In Japan, MORIKAWA (1962) and SATO (1978) reported life histories of nine soil-dwelling species in Matsuyama, Shikoku and of an arboreal species at Mt. Takao, Tokyo, respectively.

In the western lowland of Ibaraki Prefecture in central Japan, I have col-

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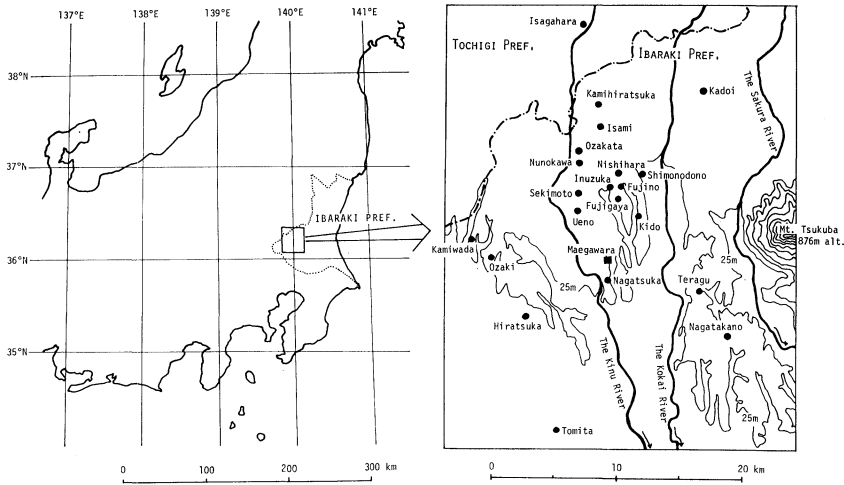


Fig. 1. A map showing the distribution of *Neobisium* (*Parobisium*) *pygmaeum* (ELLINGSEN) in a northern district of Kanto Plane. ■: The sampling site of the present study. ●: The locality where the present species was collected.

lected four species of the pseudoscorpion among which *Neobisium* (*Parobisium*) *pygmaeum* (ELLINGSEN) was dominant in number (KOBARI, unpublished). The present study was purposed to presume the life history of *N. (P.) pygmaeum* in the present population based on the seasonal change of age composition.

Materials and Methods

The sampling site for the present study, a mixed deciduous forest with bamboo, *Pleiblastus Chino*, as an undergrowth, is located at Maegawara, Shimozuma, Ibaraki Pref. in central Japan (36°13'N, 139°57'E) (Fig. 1). This site is about 400 m long and 200 m wide, and is about 25 m above sea level. The forest floor is almost flat. There was no evident disturbance by human activities during the present study period. This site rich in *N. (P.) pygmaeum* was found by several times of extensive preliminary sampling.

Sampling was done about four times a month during a fourteen-month period from May, 1978 to June, 1979. A sample, about 1/16 m² in area and 5 cm in depth, consisting of litter and soil was collected each time from any place in the sampling site. The sample was put in a large plastic bag, brought to the laboratory and divided into four or five subsamples. Animals were extracted with

Table 1. The number of individuals in each stage of *Neobisium* (*Parobisium*) *pygmaeum* (ELLINGSEN), obtained from the present sampling site (1978-1979).

Date	Stage	Protonymphs	Deutonymphs	Tritonymphs	Adult	Total
15	May, 1978	.	.	5	.	5
20		.	.	1	.	1
24		1	.	11	.	12
1	June	.	.	3	.	3
6		.	.	1	.	1
8		.	.	2	.	2
15		.	.	1	.	1
22		5	.	3	.	8
30		9	.	1	.	10
5	July	7	.	5	.	12
12		10	.	1	.	11
17		4	.	.	.	4
24		7	3	5	.	15
31		4	1	.	.	5
6	August	1	6	1	.	8
11		9	8	2	.	19
21		2	6	.	.	8
31		.	9	1	.	10
7	September	3	1	.	.	4
14		1	4	1	.	6
22		.	2	.	.	2
27		.	.	1	.	1
4	October	.	4	3	.	7
11		.	.	2	.	2
13		.	.	5	.	5
21		.	3	7	.	10
31		.	2	3	.	5
7	November	.	.	2	.	2
15		.	1	4	.	5
21		.	1	2	.	3
28		.	1	5	.	6
5	December	.	2	1	.	3
7		.	1	2	.	3
12		.	1	1	.	2
19		.	1	6	.	7
9	January, 1979	.	.	7	.	7
18		.	.	3	.	3
23		.	.	.	.	0
2	February	.	.	3	.	3
16		.	.	1	.	1
17		.	1	4	.	5
26		.	1	6	.	7
28		.	.	8	.	8
7	March	.	1	.	.	1
17		.	.	.	.	0
23		.	1	5	.	6
29		.	1	2	.	3
11	April	1	3	4	.	8
18		.	.	5	.	5
28		.	.	1	.	1
2	May	.	.	1	.	1
10		.	.	2	.	2
21		.	.	1	.	1
2	June	.	.	.	.	0
18		.	.	1	.	1
28		2	.	.	.	2
Total		66	65	142	0	273

Tullgren funnels. Extracted pseudoscorpions were partially dissected, if necessary, and mounted individually on the glass plates with Hoyer's solution as the mounting medium. A microscopic preparation was made as follows: a large cover slip (32×24 mm) used as a base was covered with a small cover slip (18×18 mm) sandwiching an animal with a drop of the mounting medium. The preparation was, then, mounted in a frame for slide film. This preparation enabled the same specimen to be examined from two sides.

The species used in the present study was identified as *Neobisium* (*Parobisium*) *pygmaeum*, as its characteristics coincided with the descriptions by ELLINGSEN (1907) and MORIKAWA (1952, 1960).

Results and Discussions

A total of 273 individuals of *N. (P.) pygmaeum*, 66 protonymphs, 65 deutonymphs and 142 tritonymphs, were collected during the present study period (Table 1). However, no individuals with adult chaetotactic characters (having four and eight tactile setae on the movable and fixed pedipalpal finger, respectively) were not found.

Protonymphs were obtained during the period from late May to mid-September, 1978, and in early April and June, 1979, but tritonymphs appeared more or less throughout all seasons. The number of tritonymphal individuals declined during the period from mid-June to late September. This period roughly coincided with the duration from the appearance to the disappearance of the protonymphs. Fig. 2 shows the monthly relative abundance of each stage to the total. The peaks for the protonymphs, deutonymphs and tritonymphs were seen in June and July, in August and September, and in months of autumn and winter, respectively.

Tritonymphs overwintered and gradually disappeared from late spring until late summer, during which the new recruitment (protonymphs) appeared in the population. Protonymphs seemed to develop into deutonymphs about two months later (in mid-summer). Many deutonymphs seemed to develop into tritonymphs more-over about two months later (in mid-autumn), and the remnants remained in deutonymphal stage until the next early spring (Fig. 2). The life cycle of this species was, therefore, presumed univoltine.

Although the present study was maintained during only about one year, the present results on the seasonal change are believed to be reproducible: About four times of sampling were performed every month to make sure the

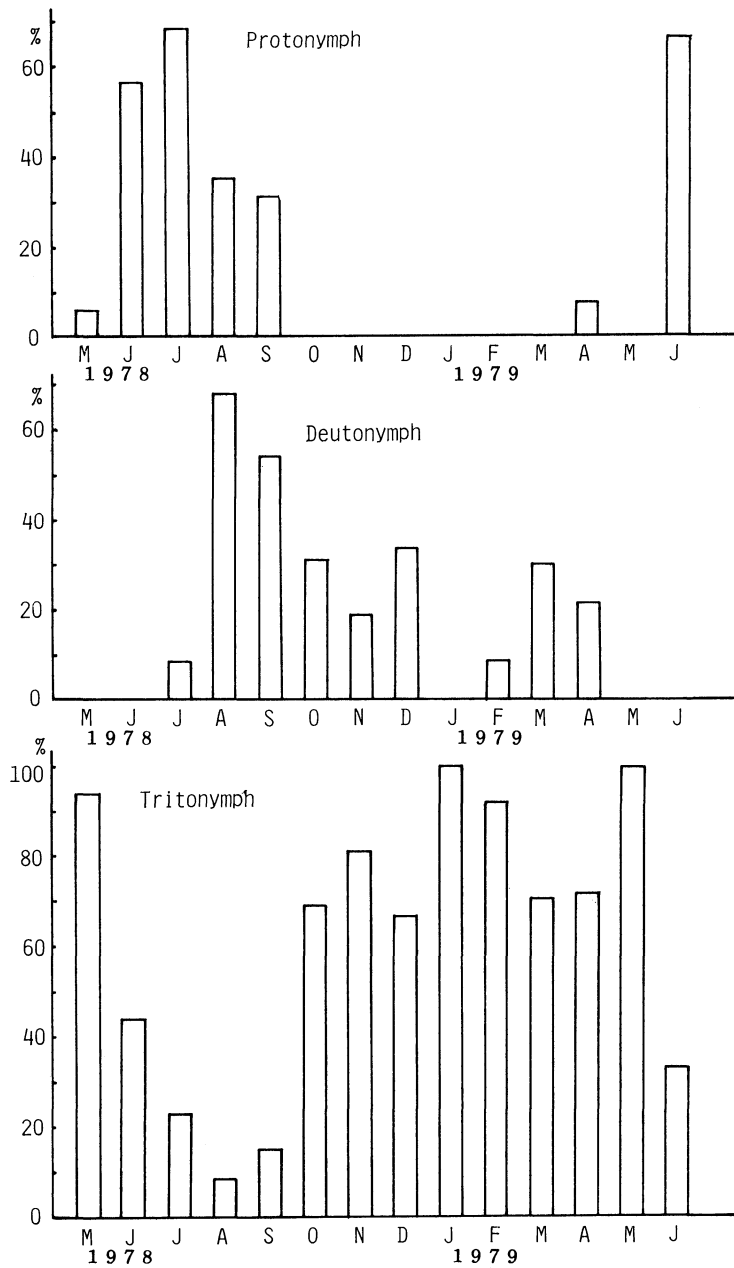


Fig. 2. A seasonal change in relative frequency of each stage of *Neobisium (Parobisium) pygmaeum* (ELLINGSEN).

results and a similar tendency in the seasonal change had been observed also in the preliminary study in another locality not so far from the present study site (KOBARI, unpublished).

In the present study, no individuals with adult chaetotactic characters were collected. It should be presumed that this was not caused by the sampling error, but the "adults" are actually absent from the population. Both ELLINGSEN (1907) and MORIKAWA (1960), who gave the description of this species, did not obtain any individual with four and eight tactile setae on the movable and fixed pedipalpal finger, respectively, which was regarded as an adult in many other pseudoscorpion species. Furthermore, a peculiar group of pseudoscorpions (genus *Microbisium*) is known in North America. In this genus, adults (mature or fully developed individuals) are known to have the tritonymphal appearance, especially in the number of tactile setae on the movable and fixed pedipalpal finger (CHAMBERLIN, 1931; HOFF, 1944, 1946, 1956, 1961; LAWSON, 1969; NELSON, 1973).

From these results and considerations, it may be probable that the tritonymph of the present species (*N. (P.) pygmaeum*) is an adult responsible to the production of protonymphs during the period from late spring to late summer. If this is proved to be true, it may be proper to say that the present species is transferred into the genus *Microbisium*.

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摘 要

小針 廣* (茨城県立結城第一高等学校, 〒307 茨城県結城市大字結城 1076): 温帯落葉樹林におけるチビコケカニムシ個体群の齢構成の季節変化。

九州を除く日本に広く分布しているチビコケカニムシの生活環を明らかにするため、1978年5月15日から1979年6月28日までの期間、茨城県下妻市で毎月定期的に採集を行なった。調査期間を通じて第1若虫が66個体、第2若虫が65個体、第3若虫が142個体の合計273個体が得られた、また各齢の個体数頻度の季節的变化にもとづき、この個体群は年1化の生活環を持つものと考えられた。

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